Annual Economic Symposium
Heavy Machinery Outlook

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FORWARD LOOKING STATEMENTS

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Key Points for the Economy

• Long cycle but relatively slow recovery from the Great Recession
• World expected to **expand** at slower rate in 2019
• Growing regional discrepancies
• U.S. economic fundamentals sound and supportive
• U.S. construction activity robust
• Need to invest more to promote U.S. competitiveness
A Broad Map of Investment Drivers

- Activity
- Confidence
- Financing
- Investment
World GDP Growth and Machine Industry

(78% Correlation)

Source: Computed using data from Association of Equipment Manufacturers/Chinese Construction Machinery Manufacturers, Haver, Caterpillar Business Economics
GDP Growth

Percent Changes in Real GDP

Source: Bloomberg Terminal forecasts and history - 11/27/2018
Global Composite Purchasing Manager Indices (PMI)

Composite PMI (SA, 50+=Expansion)

- Developed
- SA, 50+=Expansion

- Developing
- SA, 50+=Expansion

Greater volatility
Readings remain above 50

(Data through Oct. 2018)

Source: IHS/M/Haver

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Monetary Policy

Tightening continues. Aggregate real rates remain low and supportive.

Interest Rates in Percent Weighted by GDP

Developed Countries
- 2004: 4.20
- 2006: 0.65
- 2008: 0.88
- 2010: 0.20
- 2016: 0.96
- 2018: 0.96

Developing Countries
- 2004: 7.79
- 2006: 5.69
- 2008: 7.05
- 2010: 5.99
- 2016: 7.34
- 2018: 5.79

Latest
- Developed Countries: 0.96
- Developing Countries: 7.14

(Data through Oct. 2018)

Source: Haver Analytics/Caterpillar Business Economics
Developed Countries Machine Industry

Jan 2008 Units = 100
(Rolling 12 months)

Data through September 2018

Source: Association of Equipment Manufacturers/Chinese Construction Machinery Manufacturers
China Machine Industry

Jan 2008 Units = 100
(Rolling 12 months)

Data through September 2018

Source: Association of Equipment Manufacturers/Chinese Construction Machinery Manufacturers
China Construction

China Fixed Asset Investment: Infrastructure
(Transport, storage & postal service + Electricity, gas & water production and supply + Water conservancy, environment & public facilities management)

New Building Sales & Starts
(Million sq meters, SA, 3mma)

Source: CNBS, Haver Analytics, Business Economics

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Infrastructure rebound in Oct on policy support; Starts still strong, but early signs of easing
No signs of cycle end

U.S. Business Indicators

ISM Purchasing Managers Index (+50=Expanding)

Manufacturing
Nonmanufacturing

Source: ISM/Haver

Data through Oct-2018
### US Leading Indicators

<table>
<thead>
<tr>
<th></th>
<th>Threshold *</th>
<th>Sept. 2007 *</th>
<th>Latest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Curve (bps)</td>
<td>75</td>
<td>-42</td>
<td>96</td>
</tr>
<tr>
<td>TED Spread (bps)</td>
<td>50</td>
<td>150</td>
<td>27</td>
</tr>
<tr>
<td>Money Growth (% Change)</td>
<td>4.9</td>
<td>0.7</td>
<td>4.2</td>
</tr>
<tr>
<td>Light Vehicle Sales (% Change)</td>
<td>0</td>
<td>-3.0</td>
<td>-2.0</td>
</tr>
<tr>
<td>Housing Starts (% Change)</td>
<td>0</td>
<td>-32.4</td>
<td>-2.1</td>
</tr>
<tr>
<td>Freight Movements (% Change)</td>
<td>0</td>
<td>-3.1</td>
<td>4.7</td>
</tr>
</tbody>
</table>

*Notes:*
- Thresholds: Economy is typically expanding when above the thresholds for the yield curve (10-year Treasury less Fed funds rate), money growth, light vehicle sales, housing starts, and freight movements. Liquidity in the banking system is typically healthy when TED spread (3-month LIBOR less 3-month Treasury) is below the threshold.
- September 2007 benchmark: one year before Lehman Brothers filed for bankruptcy.

Source: Haver Analytics
U.S. Construction Employment

Total construction emp. up 4.7% versus total economy up 1.7% YoY

Data through Oct-2018

Employment: Construction (SA, Thous)

Heavy & Civil Engineering Construction
All Employees: Manufacturing

Nonresidential: Construction and Related Specialty Trades
Residential: Construction and Related Specialty Trades

Source: BLS/Haver
Source: Haver
U.S. Nonresidential Construction

US Real Construction Put-in-Place; millions 2012$, SA

Manufacturing
Utilities
Highways & Streets
Other Nonresidential Buildings

Data through Sep-2018

Source: BE/Haver
U.S. Housing Permits and Starts

Employment and wage growth still supportive of home buying
Weakness largely in West

Housing Starts (SAAR, Thous. Units)
New Pvt Housing Building Permit (SAAR, Thous. Units)
Housing Affordability Index (Median Inc=Qualifying Inc=100)

Data through Oct-2018

Sources: CENSUS, NAR/Haver

Housing Starts
1280 2018 fcst
1320 2019 fcst
(1-fam up 5%; multi up 9%)
As mortgage rates rise, home price growth moderates. Buyers likely to be more patient.
Some U.S. Construction Drivers

Total Number of Households, Break-adjusted
% Change - Year to Year
Composite Housing Affordability Index
SA, Median Inc=Qualifying Inc=100

AIA: Architectural Billings Index
3-month MovingAverage, SA, +50=Increasing
Capacity Utilization: Manufacturing [SIC]
SA, Percent of Capacity

(Data through Sep. 2018)
(Data through Oct. 2018)

Sources: CENSUS/H, NAR/Haver
Sources: AIA, FRB/Haver

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Some U.S. Construction Drivers (Cont’d)

Increasing production meets infrastructure constraints

Permian Crude Pipelines

<table>
<thead>
<tr>
<th>Project</th>
<th>Developer</th>
<th>Timing</th>
<th>Total possible capacity (barrels per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray Oak</td>
<td>Phillips 66 and Andeavor</td>
<td>End-2019</td>
<td>700,000 - 1,000,000</td>
</tr>
<tr>
<td>EPIC NGL Conversion</td>
<td>EPIC Midstream</td>
<td>3Q 2019</td>
<td>400,000*</td>
</tr>
<tr>
<td>EPIC Crude</td>
<td>EPIC Midstream</td>
<td>By Jan 2020</td>
<td>600,000 - 900,000</td>
</tr>
<tr>
<td>Cactus II</td>
<td>Plains All American</td>
<td>3Q 2019 - April 2020</td>
<td>585,000 - 670,000</td>
</tr>
<tr>
<td>Permian-Nederland</td>
<td>Energy Transfer, Magellan Midstream, MPLX and Delek</td>
<td>Mid-2020</td>
<td>600,000 - 1,000,000</td>
</tr>
<tr>
<td>Permian-Gulf Coast</td>
<td>Exxon Mobil and Plains All American</td>
<td>Mid-2021</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Source: Company announcements
Note: * denotes service will be temporary until EPIC Crude Pipeline enters service

Bloomberg ®

Sources: Energy Information Administration, Baker Hughes/Haver Analytics

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Caterpillar: Confidential Green
U.S. Mining Output Indexes

Industrial Production Mining (SA, 2012-100)

- Coal
- Metal Ore
- Nonmetallic Mineral Mining and Quarrying

Data through Oct-2018

Source: Haver/FRB

Production weakening
China Commodity Imports

China Commodity Imports
(Volume 3MMA, 2009=100)

<table>
<thead>
<tr>
<th>% Change</th>
<th>2017</th>
<th>Oct ’18 YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>+6%</td>
<td>+11%</td>
</tr>
<tr>
<td>Copper</td>
<td>0%</td>
<td>+19%</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>+5%</td>
<td>-1%</td>
</tr>
</tbody>
</table>

(Data through October 2018)

Source: China Customs/Haver Analytics

Caterpillar: Confidential Green